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Seeing Green in San Francisco: City as Resource Frontier

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Abstract

The early 21st century witnessed a boom in green building in San Francisco and similar cities. Major downtown property owners and investors retrofitted office towers, commissioned green certifications, and, critically, explored how greening might *pay*. Greening initiatives transcend corporate social responsibility: they represent a new attempt to enclose and speculate upon "green" value within the second nature of cities. However, this unconventional resource discovery requires a highly partial view of buildings' socio-natural entanglements in and beyond the city. I illuminate these efforts and their obscurities by exploring the experience of an exemplary green building in San Francisco, an office tower that has successively served as a headquarters organizing a vast resource periphery in the American West, a symbol and driver in the transformation of the city's own second nature, a financial "resource" in its own right, and, most recently, an asset in an emerging global market for green property.

Keywords: green building, green value, urban political economy/ecology, resource geography, financialization, San Francisco

Amid the economic turmoil of the late 2000s, the city of San Francisco saw a major building boom, of an unusual kind. Even as foreclosures continued across the metropolitan region and state and local agencies rolled out drastic austerity programs, a fresh flood of capital poured into downtown real estate. This inrush of investment did not only build new buildings; nor did it simply transfer office towers from one owner to another. It proposed to transform the city in a new way, one that fundamentally alters the nature and meaning of the city's existing built environment. Since 2008, real estate developers and investors have retrofitted hundreds of major commercial properties in San Francisco, tens of millions of square footage, and commissioned their reclassification as "green" buildings. This boom in green building, in San Francisco and similar cities across the United States and beyond, demands exploration as a phenomenon in 21st century urbanism. Moreover, I will argue here that it illuminates an important question confronting 21st century critical geography: how a self-defined green capitalism – and a distinctly "financialized" version of it – is coming to see the economic potential of cities, and what that means for the future of cities and the resource peripheries that they transform, exploit, and depend upon.

In this paper, I argue that as green capitalism radically redefines what a "resource" can mean, it is similarly transforming resource geographies, including city-resource periphery relations. Green capitalism centrally proposes that actions such as avoiding deforestation to reduce greenhouse gas emissions – or retrofitting buildings to lower their energy and water usage – do not simply conserve resources and avert environmental degradation. Instead, it argues that if nature and preserved biophysical functioning are properly valued, conservation can actually *create* resources. It has attempted to create new green commodities (eg tradable carbon permits and ecosystem services), differentiate existing markets (via value premiums to certified-green versions of commodities), monetize efficiencies (streams of savings from resources conserved, particularly if economically "internalizing" green value makes these resources more costly), and otherwise reframe pro-environmental interventions as an engine for economic development (Millennium Ecosystem Assessment 2005; UNEP 2011). As capital encloses these new sources of value and surplus value, it opens up unconventional geographies for their extraction. Notably,

it is producing new resource frontiers within the second nature of cities and urban economies themselves, sites that demand far more exploration by critical scholarship on green capitalism.

I suggest that initiatives to retrofit, certify, and market green buildings in cities like San Francisco illuminate this unconventional resource discovery, and how it articulates with parallel transformations; notably, the financialization of urban economies and urban property. Although embedded in a neoliberal context that pushes corporate social responsibility and voluntarism in environmental governance, today's greening initiatives go beyond simple compliance or "greenwashing" to a more ambitious reappraisal of nature for accumulation. Increasingly, they frame green buildings, and the "greenness" of buildings, as new objects of value, novel assets for building owners and investors to cultivate and speculate upon. However, I further argue that this green resource discovery constitutively rejects the real complexity of cities' socio-natural entanglements, both their metabolic relations with existing peripheries and their internal natures – a major limitation to their ability to produce more just, green cities. Moves to specifically *retrofit* buildings for green claim to confront the environmental significance of cities' existing built environments and the historical relations that buildings materialize, improving on certifications that cover only green design for new buildings. Nevertheless, they obscure many of these spaces' most significant socio-natural relations, past and present. This assertion particularly characterizes a wave of greening that has targeted downtown office towers, sites that wield disproportionate power to shape urban environments and the global economy. Building owners and investors can extract green returns with little reference to broader environmental transformations organized from within these spaces.

I pursue these arguments in a particular way in this paper, part of an ongoing exploration. To evaluate the theoretical and political significance of urban greening, critical scholarship requires a more concrete understanding of what greening processes look like on the ground. I further this empirical task by exploring the experience of a particular building retrofitted and certified green in the San Francisco boom that took off in the late 2000s. In this narrative, I aim to suggest a "normal" greening experience in this time and place. I draw on an increasingly massive body of published quantitative and qualitative information now being generated to justify green certifications and market green buildings by building owners, organizations such as the US Green Building Council, and real estate industry bodies.¹ However, I also explore the building's deeper history and geography, using primary and secondary textual sources: the socio-natural relations that this building's greening process has overlooked. Like other San Francisco office towers targeted for greening, the building in question, One Bush Plaza, has occupied a complex position in a changing economy and set of socio-natural relationships. Originally built as the headquarters of the Crown Zellerbach pulp and paper empire in the mid twentieth century, for decades it was used to organize a vast resource periphery on the US's Pacific Coast. A drive to secure One Bush Plaza's own exchange value factored in the midcentury urban redevelopment campaigns that utterly transformed the nature of San Francisco's downtown. However, financialization and related economic transformations in the neoliberal era have increasingly prioritized and capitalized upon this role of the building as a second natural resource: a value-bearing asset managed for investment return by ever-more-distant – functionally and geographically – rentiers. This experience argues that today's efforts to discover downtown property's green value and investment potential are merely the latest frontier in an ongoing financialization of urban nature.

With this discussion, I aim to advance critical scholarship on green capitalism. Political ecologists and related scholars in and beyond geography have produced a large body of research

on the production, unfolding contradictions, and socio-environmental consequences of green capitalism (eg Boyd et al. 2011; Brockington and Duffy 2010; Fairhead et al. 2012; Heynen et al. 2007; McAfee 1999). They have tracked new environmental enclosures and the commodification of green value worldwide in schemes such as forest carbon offsets and payments for ecosystem services. This research has helped advance a reignited critical discussion on the nature of resources, value, and their geographies (eg Bakker and Bridge 2006; Blomley 2003; Bridge 2009, 2010, 2014; Mansfield 2007; Moore 2000; Tsing 2005; and see Walker 1979). It is also beginning to engage the idea of financialized resource discovery, considering how financial institutions are opening up new resource frontiers and how distinctly financial logics motivate drives to turn resource-producing property into a collection of abstract, intangible, and interchangeable assets (Fairbairn 2014; Knuth 2015; Sullivan 2013; see also Cronon 1992 on commodity futures). However, research on green resource discovery persistently focuses on the rural peripheries – "First World" as well as in developing countries (eg McCarthy 2002) – that have been the traditional sites of resource extraction.² I argue that scholars must do more to follow green capitalism's drives into cities and other unconventional second natures. Green markets' problems capturing complex socio-natures and their capacity for accumulation by dispossession, well documented in the literature above, demand exploration in these less-explored contexts.

Simultaneously, I aim to push urban political ecology toward a greater engagement with these new resource geographies. The subfield has persuasively asserted the natural-ness of cities and explored this second nature in many forms (eg Heynen et al. 2006; Keil 2005; Lawhon et al. 2014; Smith 2008). However, while it has a foundational interest in how capital metabolizes nature in and through cities (Heynen et al. 2006), it has not fully engaged green capitalism's own growing interest in urban nature.³ Moves to commodify green value in buildings demonstrate the ambition of capital's reappraisal: office towers are less obviously "natural" than the urban natures urban political ecology has most extensively examined (eg water, green spaces, and urban ecologies).⁴ These initiatives push scholars to consider how the propositions of second nature and green capitalism increasingly challenge hard distinctions between urban political ecology and urban political economy (and see McCarthy 2012 on political ecology and political economy more broadly). Indeed, as green building becomes entangled with preexisting processes of financialization in urban property, it enters territory that has long galvanized critique and activism among geographical political economists (eg Christophers 2010, 2011; Fox Gotham 2006; Haila 1988; Harvey 1982; Smith 1996; Weber 2002, and see Theurillat and Crevoisier 2013). Finally, the troubling of city-periphery relationships we must undertake here speaks to ongoing debates on the effective boundaries of the urban in a global capitalist economy (eg Angelo and Wachsmuth 2014; Brenner 2014; Walker 2015; and see Cronon 1992): if green capitalism is now mining centers like San Francisco for resources, what does that mean for established peripheries in developing contexts and "at home"?

A City and Economy in Nature: San Francisco and the Crown Zellerbach Building

In 2015, One Bush Plaza stands acknowledged as one of the "greenest" buildings in San Francisco. It is recognized by several schemes – of an increasingly large number – that certify buildings' energy and environmental performance, and steps taken to improve that performance. The story of the building's retrofit and green certification in the years after the 2008 financial collapse will illustrate an important moment of flux in how the nature of cities is being seen, problematized, and deployed as a frontier of accumulation. Capital is using notions of green

urbanism to frame buildings like One Bush Plaza and cities like San Francisco as environmentally significant in radically new ways. And it is staking a new claim in the city being imagined in response. In this section, I begin by examining the building's history: the preexisting socio-natures in and beyond San Francisco that, as we will see, green retrofit schemes claim to confront – but as often obscure. This history also engages changes in One Bush Plaza's economic role over the last several decades, notably its financialization: necessary context for understanding the character of its more recent transformations. In the second half of the paper, I will build on this account. I will argue that One Bush Plaza's retrofit and certification process exemplifies how capital is reframing downtowns as green today, and repurposing green buildings as a resource: by strategically disconnecting buildings in time and space from certain aspects and scales of their environmental footprint while capitalizing on others; by harnessing some green features for an immediate income stream; and by exploiting others in new kinds of financial instruments.

Downtown San Francisco Transforms Nature "Without" and "Within"

In the late 1950s, the Crown Zellerbach Corporation stood at the zenith of its power in the North American timber industry and at the forefront of the Far West's distinctive resource-based rise to global economic might (Walker 2001). With rival twentieth century titans like Weyerhaeuser, Crown Zellerbach churned the massive Douglas fir, Sitka spruce, and western hemlock forestlands of the Pacific Slope into pulp, paper, and immense profits.⁵ In 1956, it produced over 1.66 million tons of paper and paperboard and recorded sales and net profits of \$462 million and \$50 million. A few years later, it faced antitrust action by the Federal Trade Commission for dominating the production and sale of coarse paper across eleven Western states (Lehman Brothers Collection 2014). As Crown Zellerbach superintended this extraction of the region's biophysical abundance and its alchemical transformation into capital, it also demonstrated the work needed to deliver these "free gifts of nature": the "discovery" and valuation of new resources; the formal redefinition of complex ecologies and cultural ecologies around these narrow objects of economic utility; the technologically mediated transformation of vast landscapes to maximize their yield. By the late 1950s, the company managed an extractive-industrial geography that spanned hundreds of thousands of acres of timberland, logging operations, and paper mills along the Pacific Coast.

In 1959, Crown Zellerbach built a new central node to manage the flows of resources and capital through this multi-state and multi-national production system, moving out of its old Art Deco headquarters in downtown San Francisco and pouring its accumulated profits into the construction of a landmark headquarters tower a few blocks away (Dinkelspiel Cerny 2007). One Bush Plaza is a nineteen-story skyscraper that monopolizes an entire city block in San Francisco's Financial District. This cluster of office towers around Montgomery and Market Streets in the northeastern-most tip of the peninsula has traditionally served as the central nervous system for the region's ruling class. It has also claimed the highest property values and rents in the city. One Bush Plaza, then known as the Crown Zellerbach Building, joined other monuments to the transformed natures of the Pacific Coast, the headquarters of fellow corporate giants that rose on resource extraction and processing: the Southern Pacific Railroad, Standard Oil of California (now Chevron), the Bechtel Group, Del Monte Foods, and Pacific Gas and Electric, among others. It also found neighbors in the leading West Coast financial institutions of the day, including Bank of America, Wells Fargo, and Crocker National Bank. San Francisco banks and financial institutions similarly boomed on the city's longstanding role, pioneered in

the 1849 Gold Rush, of organizing Western extractive-industrial booms and collecting, pooling, and redeploying the capital accumulated via these socio-environmental transformations and dispossessions (Brechtin 2006; Henderson 2003; Igler 2000; Walker 2001).

With the construction of One Bush Plaza and in its wake, J.D. Zellerbach and his contemporaries in San Francisco's business class helped reorganize the city's second nature with the same ruthlessness that they applied to its resource periphery. One Bush Plaza famously helped inaugurate a new epoch in San Francisco's urban form. The first skyscraper built in San Francisco after the Great Depression, it marked a radical break from the stone and masonry skyscrapers constructed in earlier building booms: one sparked after the 1906 earthquake and fire destroyed most of the city's nineteenth century downtown, and another that joined a wave of skyscraper construction nationwide in the 1920s (Kazin 1988). The Crown Zellerbach building helped establish new norms in high design for buildings and sites. Built by the globally prominent architectural and engineering firm Skidmore, Owings & Merrill (now SOM) as it rose to pioneer modernist architecture after World War II, the building was the first International Style glass curtain-wall tower constructed in the city (SOM 2015). Its revolutionary floor plan consigned building services to a ceramic tile-clad side tower and opened up glass-enclosed office spaces uninterrupted by internal columns. Exemplifying the architect Le Corbusier's influential vision of a "vertical garden city" of towers set in parkland (Besset 1987) – both fitting and ironic given Crown Zellerbach's central line of business in ecological alteration – One Bush Plaza's designers also made the novel choice to cede a considerable portion of its triangular site to formal garden space.

Notoriously, One Bush Plaza's architects also designed the building to turn its back on the established central business district along Market Street. This decision was one of the opening salvos in a campaign that Zellerbach and his growth machine compatriots would wage for decades: the fight to "modernize" San Francisco's urban form and its economy, and thereby to boost the city's power within a globalizing Pacific Rim economy (DeLeon 1992; Hartman 2002). Joining downtown growth machines in other US cities, they identified nineteenth and early twentieth century built environments and infrastructure as a drag on new accumulation and a threat to their own investments in downtown real estate. The Blyth-Zellerbach Committee, its vehicle the San Francisco Planning and Urban Renewal Association, and the federal urban renewal-funded San Francisco Redevelopment Agency organized massive downtown demolitions, displacements, and redevelopments from 1960 onward. One Bush Plaza was soon joined by a wave of similar high modernist glass and steel skyscrapers, while critics slammed this revolution in the city's second nature as "Manhattanization" (Brugmann and Stettland 1971).

Standing testament to the success of this class project in San Francisco, One Bush Plaza remained highly valuable property even as the urban and regional economy continued to change around it. In the fifty years since its construction, One Bush Plaza has maintained its designation as Class A property, the most expensive class of commercial real estate. In 1986, the Crown Zellerbach Corporation fell victim to an infamous hostile takeover (Pollack 1986), one of many in the mid to late-1980s wave in the United States that was an early product of neoliberal deregulation of the financial industry. One Bush Plaza was soon snapped up as the new headquarters office of the San Francisco investment bank Hambrecht and Quist, one of the regional banks heir to the city's long post-Gold Rush history as a Western financial center (Robson 1998). The space was thus reappropriated by an economic sector with a more indirect relationship to material production and socio-natural transformation. This identity shift was repeated throughout San Francisco and similar US cities as finance, insurance, business services,

and similar functions rose in economic size and share, and as US manufacturing continued a long trend of globalization and technological transformation. Hambrecht and Quist used its office tower to organize a wave of regional economic growth and transformation itself often envisioned as post-industrial and even post-material (albeit with a global resource and environmental footprint that belies these claims): with a handful of fellow San Francisco-based investment banks, it was instrumental in financing the rise of Silicon Valley and contemporary information technology in the New Economy..

The Financialization of Urban Nature

One Bush Plaza's most recent incarnation exemplifies the further transformation of San Francisco and San Francisco real estate in the global economy. This latest shift has been impelled by the ongoing rise and consolidation of the financial industry, and the changing role that urban property has played within this financialized economy. On the US federal level, the gradual erosion of the Depression Era Glass-Steagall Act, the 1994 repeal of the Bank Holding Company Act, and the 1999 passage of the Gramm–Leach–Bliley Act freed banks to consolidate commercial and investment banking functions and to centralize across US state lines. San Francisco's regional investment banks did not survive long against Wall Street's subsequent expansionary push. By 1999, Hambrecht and Quist was no more, bought out by the New York commercial bank Chase Manhattan (now part of JP Morgan Chase, the multinational banking and financial services holding company), then on the hunt to acquire an investment bank and to make a bid to enrich itself on the speculative side of the region's New Economy boom (Zuckerman 1999). When a disappointed Chase sold One Bush Plaza after the late 1990s tech bubble collapsed, what happened to the building in this transition is telling (Temple, 2003). First, it lost its role as a headquarters building. Its buyer, The Government of Singapore Investment Corporation (GIC) Real Estate, retained one suite as a branch office but turned the majority of the building over to a diverse set of financial and business services tenants, offering twenty to twenty-five rentable spaces at a time. In other words, it targeted the building primarily for its rent revenue-generating capacity rather than for its use as a space for organizing economic control functions. And second, as the real estate investment arm of Singapore's groundbreaking sovereign wealth fund, GIC Real Estate helped pioneer globalized real estate acquisition and investment strategies that increasingly shape urban space in San Francisco and worldwide.

These kinds of transformations have diminished downtown properties' significance in organizing production relative to its skyrocketing importance as a financial asset (Christophers 2010, 2011; Fox Gotham 2006; Harvey 1982). Contemporary financialization has wrung new kinds of value out of land, real estate, and real property-related debt. It has commodified that debt in the form of new financial "products" – a process of speculative resource discovery and extraction. In the US residential sector, this financial engineering prompted the global marketing of toxic mortgage-backed securities (eg Brenner 2009; Newman 2009). Even after this wave of exotic residential sector speculation collapsed in the late 2000s and took substantial portions of the global economy down with it, investors have returned to this toolkit to produce new frontiers of second natural resource extraction. Financiers seeking to develop commercial properties as assets for institutional investment portfolios and funds have advanced the use of complex instruments like commercial mortgage-backed securities (CMBs) and, significantly in the years following the 2008 collapse, real estate investment trusts (REITs). Office REITs make it possible for investors to own shares in an office tower or its mortgage, collecting a portion of tenants' pooled streams of rents or repayments over time. Public REITs allow investors to trade these

intangible property claims on exchanges like corporate stock, and thus to speculate on movements in these properties' value.

In San Francisco, ongoing experimentation with property investment vehicles has helped propel today's downtown boom, spurring popular outcry against gentrification across the city and metropolitan region and propelling ongoing displacement to the Bay Area's sprawling fringes and beyond. A new crop of office and residential towers is going up south and east of the Financial District in SoMa, in Rincon Hill and the blocks surrounding the Transbay Terminal, while major redevelopment projects like Mission Bay and, further south, Hunter's Point transform the waterfront (Brahinsky 2014; Dillon 2014). Despite national turmoil in property markets after 2008, San Francisco's downtown property values skyrocketed soon after the collapse, propelled by a new boom in Bay Area high tech investment. Assessed property values in SoMa and Mission Bay grew at rates of 10 to 12.5 percent or more annually (City and County of San Francisco 2006-2012). Real estate investors have positioned themselves to extract value from the new jumps in land and property rents, further expanding their use of frontier financial vehicles for this purpose. Replacing industrial owners and even private real estate investment companies, REITs are becoming dominant downtown property owners in San Francisco (Dineen 2013). By 2013, San Francisco's four biggest office REITs owned 12 million square feet of downtown real estate, three times what they controlled before the financial crisis. Today, three out of San Francisco's top five landlords are REITs.

An important top-five exception to this ownership trend is Tishman Speyer Properties, the New York-based, globally significant real estate development, investment, and operating company. Notably for our story, this privately held company is today the majority owner of One Bush Plaza. Like REITs, however, Tishman Speyer is pioneering new frontiers in a financialized rush on property in San Francisco, part of its global urban investment strategy. In 2004, the company purchased One Bush Plaza with seven other major properties in downtown San Francisco, giving it control over 1.99 million square feet of space in six towers in the Financial District and SoMa (Emporis 2014). This massive burst of acquisition among San Francisco's premium commercial properties was typical for the company, which has increasingly targeted global cities worldwide. In 1988, it expanded into the European market; in 1995, it targeted acquisitions in Brazil; in 2006, it acquired properties in several cities in China and India. The company now operates a portfolio of over 90.9 million square feet of office space globally, typically highly expensive properties such as Rockefeller Center, the Chrysler Building, and the MetLife Building in Manhattan (Tishman Speyer 2014a). Tishman Speyer's global real estate investment strategy exemplifies the contemporary geographic scope of major investors' ambition, and their increasing power to shape a globalized urban environment. Moreover, Tishman Speyer's practices demonstrate the extractive side of finance: its recurrent tendency toward unproductive property speculation – and toward exploiting others' wealth in its successes and failures. The company is notorious for its 2000s bubble practices of highly leveraged "OPM" property investment: ie "other people's money" (Bagli 2011, 2013; Dealbook 2010). For example, when Tishman Speyer's massive Stuyvesant Town development in New York – touted as the biggest real estate deal in history – failed in the crisis, Tishman Speyer itself lost \$56 million. However, it passed the bulk of this loss onto its many lenders, including California's public pension fund (CalPERS): they lost over \$2.4 *billion*.

This story has tracked One Bush Plaza's articulation with several frontiers of political economic transformation, in and beyond San Francisco. The building has been deployed as a

space for organizing resource extraction across an extensive periphery. Its construction was simultaneously used to anchor a revolution in San Francisco's second nature. As we will see, this history continues to shape One Bush Plaza's socio-environmental relations – in ways that green building retrofit and certification processes acknowledge, and in ways that they obscure. Moreover, the growing prioritization of the building's exchange value, and that value's commodification for distant investors, are particularly important in understanding how and why its greening has been deployed for accumulation.

Seeing Green in San Francisco

Today, Tishman Speyer advertises that its international real estate portfolio includes 47 million square feet of space certified green or awaiting certification, in forty-eight projects (Tishman Speyer 2014b).⁶ The property company first launched efforts to register One Bush Plaza with the US Green Building Council (USGBC), the US's largest green building organization, in 2010. It did so along with many other skyscrapers in its US portfolio and amidst a wave of similar national green certification activity. In October 2014, the USGBC's database recorded over 2.6 billion square feet of LEED-certified space in the United States, in over 228,000 buildings with some kind of LEED activity. The bulk of this square footage was added after 2008 (GBIG 2014a). Real estate literature projects that this rapid expansion will continue. For example, Pike Research (2010) projects that the global green property market (LEED and other certifications) will have grown 780 percent between 2010 and 2020, with concentrations developing in cities in China and India. The USGBC's Leadership in Energy and Environmental Design (LEED) certification deploys a long checklist of green design elements and operational features, which USGBC-accredited certifiers assess separately and aggregate to assign a total score. Broad criteria range from energy and water use efficiency measures to sustainable site design and location, green materials and waste management, and indoor air quality. In 2011, the USGBC recognized One Bush Plaza with a Platinum level certification, its highest building rating. This certification's selective vision of One Bush Plaza's socio-natural entanglements, past and present, reveals some of the problems of green retrofit and certification processes. Meanwhile, how Tishman Speyer and other building owners are using green certification begins to suggest why these issues *matter* in attempts to create more environmentally and socially just cities.

The Nature Green Certification Sees – And Overlooks

The specific LEED classification and checklist that Tishman Speyer sought for One Bush Plaza was the USGBC's LEED for Existing Buildings: Operations & Management (EBOM). The vast majority of green buildings certified in San Francisco since 2008 employed this existing buildings certification. The more established LEED certification, Building Design and Construction, considers the costs in materials, energy, and environmental disruption needed to build new structures, and design and construction alternatives; EBOM certifies building retrofits and management interventions to lower the footprint of ongoing operation. Tishman Speyer advertises that, when originally labeled in 2009, One Bush Plaza was one of only six buildings in San Francisco to obtain the EBOM certification, out of forty-six buildings nationally (USGBC 2014). By the end of 2013, EBOM certifications had topped 100 in San Francisco and 2,300 in the United States, a massive 60 million and 942 million square feet of space, respectively. On average, 93 percent or higher of LEED certifications obtained annually in San Francisco between 2008 and 2013 were for existing buildings (GBIG 2014a, 2014b). Digging into San Francisco's trend shows that the buildings certified were almost exclusively, like One Bush Plaza, large

commercial properties in the financial district: offices, residential towers, and hotels. This total helps explain why corporate owners and investors had become by 2014 the top two types of green building owners in the city. Before 2008, non-profits and public buildings had dominated these totals (Cidell 2009; GBIG 2014b).

The retrofits and operational changes that Tishman Speyer initiated to obtain One Bush Plaza a LEED Platinum rating illustrate how the EBOM rating, and LEED in general, deal with questions of geography, history, and responsibility when assigning credits or withholding them. As I explore this process, I utilize Tishman Speyer's copious documentation of its green retrofit and certification, published in company reports and made broadly available in various USGBC forums. This data includes quantitative data LEED scorecards and quantified resource savings; it also encompasses a certified narrative of the greening process, among other published qualitative information. At the broadest level, EBOM does make a critical advance on LEED's original certification. It attempts to address the fact that most of the built environment in the United States is already set down, and that demolishing and building these landscapes anew for green performance, urban renewal-style, would have major resource and environmental – as well as social – costs. It thus takes on an important, specifically historical task. It opens for consideration environmentally significant decisions of a building's past, and how the accumulated weight of these past decisions shapes resource use and environmental impact in a building's present. Furthermore, it judges how to represent this history and present in a way that enables improvements – especially improvements that can be readily quantified.

As it takes up this admittedly difficult undertaking, LEED EBOM nonetheless embodies many problematic decisions. Foundationally, it allows building owners like Tishman Speyer to selectively claim some environmental impacts of a building's past that it can green, while ignoring others that others might find as or more relevant. Notably, for example, EBOM mostly ignores the original construction footprint as it focuses on how to improve buildings in operation: ie One Bush Plaza's original construction in the late 1950s would have meant a spike of energy use and resource consumption. LEED EBOM largely does not make buildings' current owner(s) responsible for these past impacts or their ongoing influence on the building's water use, energy use, material throughput, and other elements of its metabolism. This pass on past impacts is partly the *point*: they are done now, for good or ill. Replacing the building would double down on many of these effects – if not particularly jarring legacies like the old growth redwood timber that might easily show up in EBOM-certified buildings in San Francisco. Moreover, if it had existed at the time, LEED might have changed some decisions that place upward limits on how green a building can be made. For example, basic design decisions like a building's size and allocation of space delimit its potential energy efficiency.

More problematically, while freeing buildings from responsibility for their full life cycle energy and resource costs, LEED EBOM selectively reframes narrow, tractable aspects of these inherited problems as opportunities. For example, Tishman Speyer was able to achieve a number of points on its LEED checklist by addressing the many low-hanging fruit its problematic siting offered (see Table 1 below, and USGBC 2014 for the building's full checklist). Its questionable midcentury landscape design – that filled a large open site in the water-constrained Bay Area with non-native, water-hungry plants – was recast as a green windfall. Tishman Speyer achieved both "Sustainable Sites" and "Water Efficiency" points by relatively simple expedients such as converting the site's plantings to native species, shifting from automated sprinklers to hand-watering, and maintaining it as greenspace rather than paving it over. Certifiers decided that One Bush Plaza merited three points for water efficient landscaping, although it could have earned up

to five, and it earned an extra bonus point as the Bay Area's ongoing water supply problems made conserving water in landscaping a "Regional Priority Credit." Its narrative also promotes the site as "protected/restored habitat," a questionable claim on downtown land that has been particularly densely urbanized for a century.

Table 1: Selected Credits for 2011 LEED Platinum Rating, One Bush Plaza

LEED Operations and Management: Existing Buildings (EBOM) (Data Source: USGBC 2014)
[Table 1 here]

In a notable contradiction, LEED EBOM simultaneously allows property owners to claim dozens of points for now-beneficial decisions made at the time of original construction. For example, another important part of One Bush Plaza's high LEED score was its accessibility via mass transit. The EBOM checklist reserves a relatively massive fifteen potential points for this question of a building's place within a broader urban landscape of energy use and emissions. It constitutes part of the USGBC's ongoing response to criticisms of LEED certifications awarded to buildings on greenfield, auto-dependent exurban sites. One Bush Plaza earned all fifteen of these points, plus a regional bonus point, for "Alternate Commuting Transportation." These totals reflect the building's downtown location, particularly its close proximity to the regional Bay Area Rapid Transit (BART) rail system and to the dozens of bus and streetcar lines that similarly converge on Market Street. Like high urban land rents, transit accessibility here is an attribute of the entire urban system that downtown real estate owners can attach to a specific parcel of property – and claim the unearned profit from (eg Harvey 1982). And, like One Bush Plaza's site design, downtown location is an attribute that Tishman Speyer did not create but inherited when it bought the building. On one hand, it could be interpreted as the outcome of past action associated with One Bush Plaza, because the 1960s and 1970s work of J.D. Zellerbach and the Blyth-Zellerbach Committee made sure BART and other twentieth century Bay Area transit systems prioritized regional access to San Francisco's Central Business District. On the other, if the full socio-environmental costs of these networks' reshaping of urban geography were counted, the building would be held responsible for a share in the widespread socio-environmental costs as well as the narrow benefits of massive racialized demolitions and displacements in places like West Oakland – in addition to longer-term underfunding of older transit networks (Hartman 2002; Self 2003; Walker 2008).

Finally, and critically, the actual business of the office towers that EBOM certifies is largely absent from its consideration.⁷ A highly rated green building can house owners or tenants whose activities are deeply implicated in resource extraction and environmental change. For example, even if One Bush Plaza were still owned by a pulp and paper company, the environmental transformations of its vast geography of extraction and processing would not count against the building. The same thing is true of oil and gas companies today, as Houston's contemporary boom in LEED certification demonstrates (GBIG 2014c). Corporate social and environmental responsibility reporting for these kinds of resource extraction industries can point to companies' "close to home" green actions and elide their more thoroughgoing involvement in environmental change. Financial tenants have still more levels of abstraction between their decisions and the socio-environmental consequences of those decisions. This issue is one scalar disjuncture among the many that arise when individual buildings are framed as a locus of environmental action. A lens trained on individual buildings frames environmental action as the aggregation of myriad points of individual greening. This perspective overlooks broader

systemic relations, whether they be the networked transportation infrastructures and flows that show up so imperfectly in LEED scores or broader territories of environmental change.

Capital Puts Greening to Work

The selective inclusions and silences of green retrofits and certifications become increasingly salient as developers and investors move to mainstream these greening processes, and make them pay. Many players are now working to convert green building into a resource for real estate developers, owners, and investors, and to harness those streams of green value added for new financial instruments and investment markets. One Bush Plaza's experience illustrates how these new green resource discovery processes are working, from direct savings from energy retrofits and attempts to financialize them to more speculative maneuvering around the investment potential of green property.

One Bush Plaza's LEED checklist shows that energy efficiency in operations provided its largest single source of points awarded – and, as we will see, its most direct source of green revenue. Tishman Speyer initiated a building commissioning process to test and fix building systems including HVAC, electricity, and lighting. Breakdowns and inefficiencies in these massive mechanical systems are one of the most important ways that "nature" makes itself felt in large buildings: weathering's slow physical transformation of second natures. Working with a green building consultant, Tishman Speyer tuned condensers and chillers in One Bush Plaza's HVAC systems, retrofitted lighting, and tracked the building's greenhouse gas emissions and reported reductions. One Bush Plaza had already used an energy modeling system to track energy use in the building before the LEED certification process; this feature was part of what Tishman Speyer used to apply for an Energy Star Office certification in 2008. It had the building re-certified according to this second scheme in 2010 and again in 2012 (GBIG 2014d). Energy Star measures buildings' operational energy performance relative to comparable buildings, calculated by the US Environmental Protection Agency's Energy Star Portfolio Manager benchmark based on reported building characteristics and utility bills. One Bush Plaza's 2012 Energy Star score, ninety-five out of a possible hundred, means that it performed better than ninety-five percent of its peers that year. Among its ongoing interventions, the company has installed, or plans to install shortly, lighting occupancy sensors and other automatic building features. These controls, with data-gathering devices such as energy sub-metering for different parts of the building, constitute key infrastructure in emerging real-time energy monitoring and "big data"-based bids to alter those patterns.

Private building owners have long concerned themselves with the issue of "cost-neutrality" in retrofits and green building more generally. They do not want to make investments in (re)building and certification that they cannot recoup financially in some way – one reason public buildings and non-profits with a social-environmental mission dominated green building until the last few years. For green building more generally, in the past corporate or investor owners have had to satisfy themselves with more qualitative kinds of added-value, as expressed in corporate social and environmental responsibility reporting or tenant satisfaction. Not surprisingly, a healthy business has sprung up to try to convert these qualitative descriptions to dollar figures. In the case of One Bush Plaza, Tishman Speyer tracked its spending carefully. Representatives calculated that it invested \$94,000, or \$0.31 per square foot, to conduct One Bush Plaza's retrofit and to pay to certify the building with the USGBC – costs that they argued were far below average (USGBC 2014). The company also looked for many ways that LEED certification could make One Bush Plaza cheaper to operate. For example, it argued that reducing

waste generated in the building cut the costs of trash handling in half, savings of almost \$25,000 annually. Energy efficiency retrofits stand to save the company much more:

[Commissioning saved] over 300,000 kilowatt hours and 450,000 kBTUs that equates to an estimated annual cost savings of over \$75,000. Many of these upgrades were low-cost or no-cost items, and the commissioning process also helped to create a capital plan for other upgrades that have a significant return and a low pay-back. One Bush has also committed to ongoing commissioning because of the value that the process has already added to the project (Kristin Walker, Consultant, Waypoint Building Group, USGBC 2014).

The framing that Tishman Speyer's consultant uses in the quote above illustrates how green valuation logics can move beyond questions of payback into generative visions of *accumulation*: in particular, how money from energy conserved can become capital to be reinvested in a building or extracted. Alongside the mainstreaming of green building after the financial collapse, the contemporary moment has seen a major boom in energy services companies (ESCOs) and other ventures that aim to turn these streams of energy savings into a business; in the United States, sometimes in partnership with investor-owned utilities. McKinsey & Co., for example, has promoted energy efficiency as a resource to companies and investors in its self-appointed role in opening up new markets (McKinsey & Co. 2009). Other market-making entities speculate that this accumulation frontier will expand drastically in the coming years. Pike Research (2012) estimates that the global retrofit market alone for commercial and public buildings will expand from \$80.3 billion in 2011 to \$151.8 billion by 2020. New financial instruments have sprung up around the financial challenge and opportunity of energy efficiency retrofitting, from property assessed clean energy (PACE) schemes (undergoing ongoing difficulty in the residential sector but active for commercial property), to utility on-bill financing schemes, to a range of new private financing start-ups. San Francisco, among other cities, has partnered with these experimental financing ventures to develop new green instruments and markets (City and County of San Francisco 2014).⁸

Tishman Speyer and other corporate and investor owners of real estate are moving to convert these expanding markets into appreciation in the value of their assets. Characteristic of the way that green building is increasingly framed within the mainstream real estate industry, Tishman Speyer is open and celebratory about its intention to make greening pay. The company outlines LEED certification as a strategy that goes far beyond One Bush Plaza or the other skyscrapers it owns and plans to build in San Francisco. It advertises how it has worked to green much of its property portfolio concurrently (USGBC 2014). Tishman Speyer's corporate statements on sustainability present a "business case" that emphasizes greening as a direct investment strategy as much as a bid for corporate social responsibility-style brand cachet – or greenwashing as a response to the company's infamy in the financial crisis. As well as publishing statistics on its LEED-certified space, certifications by other international green building standards, and Energy Star labeling, Tishman Speyer makes it clear that it intends greening to make its property more competitive and to increase its rents from tenants, value on sale, and overall profitability (Tishman Speyer 2012, 2014b; USGBC 2014).

Finally, Tishman Speyer is moving with other players in real estate to establish green buildings as assets in ways that go beyond the value that savings on utility bills directly adds to retrofitted properties: they propose that green certification will make their properties *intrinsically* more valuable. Advocates increasingly echo the logic that has permitted premium valuation for other certified-green commodities like organic food. They frame a niche product whose value is

established as consumers prove willing to pay more for it. Real estate industry bodies have used market analysis to discover this value premium for green property, a numerically significant rent over and above that of otherwise comparable conventional buildings. Aided by the recent dramatic increases in the number of commercial buildings certified green in the United States and globally, influential studies have statistically compared large-*n* samples of properties to find and publicize this value premium (eg Eicholtz et al. 2010; Fuerst and McAllister 2010; Miller et al. 2008). Authors present their findings as an empirical indication that building owners and tenants are evidently willing to pay more for green – whatever their underlying motivations for this investment might be. These exercises signal to financial institutions that green properties can be a distinct, valuable resource for cultivation and investment. And significantly, this form of resource discovery presents no firm upper limit to precisely how valuable green buildings, or the value that greenness adds to buildings, might become. Ongoing investment can continue to drive this value up as long as investors maintain interest and confidence – the fundamental logic of real estate booms, bubbles, and other asset price run-ups. It is in this territory of potential herd effects and untethered real estate appreciation that greening offers the most speculative potential for finance.

With other real estate investors, Tishman Speyer is now helping to produce green financial space through the creation of new instruments and markets. For example, Tishman Speyer advertises its participation in the Global Real Estate Sustainability Benchmark (GRESB) Survey, a tool that surveys publicly traded REITs and private funds run by companies like Tishman Speyer for investment in sustainable properties. Major institutional investors use the tool to target green portfolio investment. In 2011, seven of Tishman Speyer's real estate investment funds earned GRESB's Green Star designation (Tishman Speyer 2012). The National Association of Real Estate Trusts (NAREIT), the association that represents US REITs, now works with GRESB to track and recognize sustainable investment (Piperato 2013; Popovec 2012). The USGBC also entered the field in 2013. It partnered with NAREIT and FTSE Group, a subsidiary of the London Stock Exchange that provides stock indices, to create a green property index, FTSE NAREIT USGBC. With this index, the USGBC aims to independently score a set of REITs commonly used as a benchmark for US real estate for their green investment, measured as the relative value of their real estate portfolio that has received a LEED certification or Energy Star label (Hirsch 2013). Finally, the last few years have also seen the creation of real estate investment funds that specifically target green properties, instruments that make direct bets on these buildings increasing in value (eg Bloomberg 2014; HIP Investor 2014). Together, these efforts allow investors an increasing ability to invest in – and speculate upon – the future of green urbanism.

Conclusion: Interpreting A New Urban Frontier

In this paper, I have argued that urban greening in San Francisco and similar cities today must be understood as a) part of a deeper history of articulation between downtown power, downtown property, and environmental change in and beyond cities and b) a developing frontier not only among other contemporary green enclosures but also in a more protracted process of financialized resource discovery directed at urban property. Both dimensions, and the conflicted relationship between them, help us begin to interpret what today's green building boom means to a broader green capitalism, and its critique. I draw two initial conclusions here. First, efforts to make downtowns a space for green resource extraction evidently struggle to capture complex natures, much as environmental enclosures in rural spaces do – albeit with different kinds of

value failures and political stakes. Second, green capitalism's expanding urban frontier does not simply present a new landscape for critical analysis. Rather, its financialized processes of resource discovery transgress traditional distinctions in how capital has used urban centers versus peripheries.

The task of producing green, just cities depends on getting urban retrofits right. Certifications like LEED EBOM are correct to focus on existing urban built environments as one major challenge in efforts to transition to less resource-intensive, socio-environmentally destabilizing societies. However, EBOM's propensity to flatten and selectively incorporate buildings' complex socio-natures indicates a shallowness in its vision of green. Its silences reflect its need to make retrofits attractive for green markets: to help investors see just enough of a building's environmental footprint to construct a profitable source of green value, without bringing in socio-natures and metabolic relations less tractable for capital accumulation. Weak greening is an environmental justice problem in its own right when confronting things like cities' contribution to global climate change. It assumes additional significance when greening cities and industrial economies is promoted as a corrective: a fairer and more effective alternative to schemes that displace needed changes to traditional peripheries (eg in the form of carbon offsets). Moreover, grounds for questioning building certifications pose additional risks to capital itself – with varying political stakes depending on how and where investors are able to displace the costs of failed gambles. Schemes like carbon offsets in traditional resource peripheries have confronted intractable socio-natural complexities in their attempts to deliver genuine, marketable conservation. However, failures to realize promised green value and resulting market collapses assume different significance when the resource-producing property in question circulates more among the rich than the poor. Failures are likely to be more visible and hit capital closer to home. These value negotiations and political stakes demand more examination, particularly as greening articulates with other drivers of real estate speculation, ongoing inequality and displacement, and potential crisis in cities like San Francisco.

Finally, examining the urban frontiers of green capitalism illuminates its broader geography. For one thing, financial instruments such as REITs that were originally developed to make downtown property more "investable" are now being adapted to enable unconventional investment in rural resource-producing land – forestland and now farmland. Critical scholarship has implicated these urban-rural chains of property financialization in massive land transfers after the 2008 financial collapse (Fairbairn 2014; Knuth 2015). Moreover, it matters that green resource discover in cities was rolled out contemporaneously with these global rural land grabs, and "green" grabs for the production of resources such as carbon offsets and biofuel feedstocks (Fairbairn et al. 2012). Using instruments like climate change funds (Knuth 2015), investors are increasingly treating rural and urban landscapes as a *common* landscape of green resource extraction. These processes demand exploration across critical geography: as capital reinvents its definition of value and resources, it increasingly transforms the spaces that produce – and extract – this value.

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¹ This methodological approach is suggestive rather than perfectly representational. Future research will more fully capture the contemporary greening experience by considering different buildings, types of buildings, scales of intervention, and other lenses. In addition, I rely here on "official" accounts of the motivations for and experience of greening. Further work is needed to examine how accurately these public framings represent actual practice.

² I preferentially use "peripheries" rather than "hinterlands" throughout this discussion – it indicates the global nature of the resource geographies cities like San Francisco were and are embedded within.

³ I argue that the markets now being created around green buildings have gone beyond capital's more indirect earlier attempts to harness an urban environmental aesthetic for accumulation (eg Quastel 2009).

⁴ For example, Biehler and Simon (2010) make an important intervention regarding the political ecology of buildings but focus heavily on the biotic dimensions of indoor environments.

⁵ Prudham (2004) explores this Pacific Slope timber boom.

⁶ Including international green building certifications such as BREEAM.

⁷ Unless it shows up in different patterns of energy use in a building. Offices, residential towers, and hotels will have different footprints.

⁸ California's market-based regulation requiring LEED certification for *new* buildings also indirectly affects San Francisco's wave of retrofits; I discuss this dynamic in other forthcoming work.